AMENDMENTS TO THE CLAIMS:

This listing of claims replaces all prior versions and listings of claims in the application.

LISTING OF CLAIMS:

1. (Currently Amended) A transistor comprising:

an emitter region;

a collector; and

a base layer having a base contact, the base layer comprising:

an intrinsic region between the emitter region and the collector;

an extrinsic region between the intrinsic region and the base contact; and

a first doping layer that is doped with a trivalent substance, and that extends into the extrinsic region~~, and that is counter-doped with a pentavalent substance from the emitter region~~;

a second doping layer that is doped with a trivalent substance, and that is between the first doping layer and the collector, the first and second doping layers being counter-doped with a pentavalent substance from the emitter region; and

a third doping layer that is doped with a trivalent substance, and that is between the second doping layer and the collector;

wherein the base layer comprises carbon atoms having a concentration greater than $1x10^{18}$ $cm^{-3}$; and

wherein a concentration of trivalent substance in the second doping layer is less than a concentration of trivalent substance in the first doping layer, and the concentration of trivalent

substance in the second doping layer is less than a concentration of trivalent substance in the third doping layer.

2. (Previously Presented) The transistor of claim 1, wherein the trivalent substance comprises boron.

3. (Cancelled)

4. (Previously Presented) The transistor of claim 1, wherein the first doping layer comprises at least 30% of a total amount of a doping substance in the base layer.

5 and 6. (Cancelled)

7. (Currently Amended) The transistor of claim 2 ~~3~~, wherein the first doping layer comprises at least 30% of a total amount of a doping substance in the base layer.

8 to 10. (Cancelled)

11. (Currently Amended) The transistor of claim 1 ~~3~~, wherein the second doping layer and the third doping layer are doped with germanium;

12. (Previously Presented) The transistor of claim 11, wherein:

a concentration of germanium in the second doping layer and the third doping layer decreases from a high point at the collector to a low point in the second layer; and

a decrease in the concentration of germanium from the high point to the low point is substantially constant.

13. (Previously Presented) A transistor comprising:

a base layer comprising:

a first doping layer that is doped with a trivalent substance;

a second doping layer adjacent to the first doping layer and having a lower concentration of the trivalent substance than the first doping layer; and

a third doping layer adjacent to the second doping layer and having a higher concentration of the trivalent substance than the second doping layer;

wherein the first doping layer and the second doping layer are counter-doped with a pentavalent substance from an emitter region of the transistor; and

wherein the base layer comprises carbon atoms having a concentration greater than $1x10^{18}$ $cm^{-3}$.

14. (Previously Presented) The transistor of claim 13, wherein the second doping layer and the third doping layer are doped with germanium.

15. (Previously Presented) The transistor of claim 14, wherein a concentration of germanium in the second doping layer and the third doping layer decreases from a high point at a collector region of the transmitter to a low point in the second layer.

16. (Previously Presented) The transistor of claim 14, wherein a decrease in the concentration of germanium from the high point to the low point is substantially constant.

17. (Previously Presented) The transistor of claim 11, wherein the trivalent substance comprises boron.

18. (Previously Presented) The transistor of claim 11, wherein the pentavalent substance comprises arsenic having a concentration of between $1x10^{20}$ $cm^{-3}$ and $1x10^{21}$ $cm^{-3}$.

19 to 27. (Cancelled)

28. (Currently Amended) A transistor comprising:

an emitter region;

a collector; and

a base layer having a base contact, the base layer comprising:

an intrinsic region between the emitter region and the collector;

an extrinsic region between the intrinsic region and the base contact; and

a first doping layer that is doped with a trivalent substance, that extends into the extrinsic region, and that is counter-doped with a pentavalent substance from the emitter region, wherein the first doping layer comprises a concentration of the trivalent substance that is between $1x10^{18}$ $cm^{-3}$ and $5x10^{20}$ $cm^{-3}$;

a second doping layer that is doped with the trivalent substance, that extends into the extrinsic region, and that is counter-doped, at least part-way through, with a pentavalent substance from the emitter region, wherein the second doping layer comprises a concentration of the pentavalent substance that is between $1x10^{20}$ $cm^{-3}$ and $1x10^{21}$ $cm^{-3}$, wherein the second doping layer comprises a concentration of the trivalent substance that is between $1x10^{18}$ $cm^{-3}$ and $1x10^{19}$ $cm^{-3}$~~, and wherein a PN junction generated by counter-doping with the pentavalent substance is in about a middle of the second doping layer;~~ and

a third doping layer that is doped with the trivalent substance, the third doping layer being adjacent to the collector, wherein the third doping layer comprises a concentration of the dopant that is between $5x10^{18}$ $cm^{-3}$ and $1x10^{20}$;

wherein the second doping layer is between the first doping layer and the third doping layer, and wherein the second doping layer has a lower concentration of the trivalent substance than both the first doping layer and the third doping layer;

wherein the first doping layer, the second doping layer, and the third doping layer are separated from the emitter region by a portion of the base layer; and

wherein the base layer comprises carbon atoms having a concentration greater than $1x10^{18}$ $cm^{-3}$.